

Upper South Creek

Advanced Water Recycling Centre and Pipelines

Community Agreement 02 – Nepean River HDD

EPL 21800

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Introduction

The Upper South Creek Advanced Water Recycling Centre (AWRC) (the project) has been proposed to support the population growth and economic development of the Western Sydney Aerotropolis Growth Area (WSAGA or Aerotropolis), South West Growth Area (SWGA) and the new Western Sydney International Airport. The project will provide wastewater services to Western Sydney to produce high-quality treated water for non-drinking reuse and for release to local waterways. John Holland has been appointed by Sydney Water to deliver the project works, with detailed design and construction for treating a daily wastewater flow of up to 35ML/day.

John Holland has obtained Environment Protection License (EPL 21800) from the NSW Environment Protection Authority for the construction of the project and has prepared the following written report for submission to the EPA as John Holland are seeking to undertake work outside of approved construction hours following community consultation and agreement (EPL condition E1).

Scope of Works and Further Details

The Project is carrying out horizontal directional drilling (HDD) as a method of installing pipe at various locations. This method is used to ensure that there is minimal impact to nearby sensitive and complex environments as a result of the work.

One of the key HDD operations for the Project is the crossing of the Nepean River, located in Wallacia, NSW. The local geology at this location is complex, and when considered with the potential risk and impact of flood events and the need to manoeuvre a large diameter high-density polyethylene (HDPE) pipe, review of additional measures (including revision of and amendment to standard construction hours) is a critical part of construction planning that the project has considered.

Further details and context regarding the work activity, surrounding environment and associated risks are provided below:

- Locally there is a thick alluvial soil layer up to 16m deep and overlying rock. Managing the soft and swellable nature of the alluvial soils is difficult during HDD and at times this will require active drilling time in the bore for longer durations in comparison to other geological conditions.
- The Nepean River is the largest body of water that the treated water pipeline alignment passes under and hence the HDD involves the longest residence time underground.
- Active drilling time during HDD operations constitute the turning of rods and drilling fluid being pumped through the bore. These activities assist in maintaining the stability of the bore hole via compaction (from the reamer) and positive pressure (from the drilling fluids). Longer periods of inactivity can increase the likelihood of bore collapse.
- Once commenced, continued drilling of a borehole at key locations (for example, under a waterway) will reduce the risk of 'tooling' and the pipe becoming stuck. This is critical to ensuring the continued safety of HDD operators and shortening the overall duration that the HDD operations under the Nepean River.
- 'Tooling' refers to the cutting tool attached to the end of the drill rods which physically breaks through the ground formation, loosening the material so it can be carried out of the bore by the flowing drill fluid/mud. When tooling becomes stuck, this creates an additional hazard to the HDD operators due to the forces and methodology required to be applied to the drilling pipe to free the tooling up. Crossing the river and installing the pipe as quickly as possible reduces the risk of collapse within the bore as the bore is left open for a shorter period of time.

Figure 1 details the area at which the works will take place and Figure 2 details the locations in relation to their surrounding environment.



Figure 1: Location of works on site in Wallacia

Options Considered

During construction planning, options to manage the soft soils have been considered including the installation of steel conductor casing to help prevent hole collapse.

Steel conductor casing involves large hollow pipe (400mm in diameter) being pushed into the ground from the HDD entry pit (on the eastern bank of the Nepean River), through the alluvial ground and down to firmer material. This casing supports the ground and prevents the alluvial ground from collapsing into the bore. As the borehole is increased in size through reaming passes, the steel conductor casing will need to be removed as eventually the larger diameter reams of the treated water HDD (progressing up to 1200mm diameter), will need to take its place.

With the conductor steel casing having been removed, the alluvial ground will no longer have this additional support, thereby increasing the need for continued work and quicker installation to avoid the risk of bore collapse.

Purpose

The purpose of seeking a community agreement is due to the need to achieve safety and technical requirements associated with HDD operations under a significant waterway, such as the Nepean River, to manage and mitigate the risks described in detail in the sections above. The project is proposing to work outside standard construction hours specified in EPL condition L5.1, under a community agreement arrangement.

The project noise model has identified nearby residents who will be impacted by the works during the HDD operation at the Nepean River. The project is thus seeking community agreement from these residence in accordance with the projects EPL condition E1.



Figure 2: Site layouts

E1 Community Agreement

**John Holland notes that the current EPL has referenced L4 conditions under Condition E1.1 and has assumed that these condition references are incorrect, and that reference should be made to L5 conditions.*

Condition E1.1

Work outside standard construction hours – community consultation and agreement.

The licensee may work outside standard construction hours (as defined in L5.1) in circumstances other than those permitted under conditions L5.3*, L5.4*, or any other condition of this licence if the Licensee:*

a) undertakes community consultation and agreement as described in E1.2;

- The project has undertaken community consultation with the affected residents that were identified in the noise model.

b) submits to the EPA a written request to work outside the standard construction hours attaching information set out in E1.3; and

- This document details information to work outside the standard construction hours. Specifically, the project is seeking approval to work from 1pm to 6 pm on Saturday on the 24th February 2024 and in the month of March 2024 on the 2nd, 9th, 16th and 23rd.

c) obtains approval by the EPA to work outside standard construction hours. The EPA may, in exercising its discretion to approve the works outside standard construction hours, review whether the licensee has obtained community agreement. Specifically, whether a substantial majority of the individual Noise Sensitive Receivers who together comprise the Community Affected Catchments and were contacted has consented to the planned works out of standard hours.

- John Holland notes that approval must be obtained from the EPA to undertake the work proposed in this community agreement.
- 14 out of 15 residents supported working extended hours on Saturday. One resident did not support extended working hours. Evidence of compliance to be reviewed by the EPA.

Condition E1.2

Requirements for community consultation and agreement

Any community consultation and agreement undertaken with respect to the proposed out of hours works (OOHW) must:

a) be prepared and implemented in accordance with the Interim Construction Noise Guidelines (DEC 2009), the Noise Policy for Industry (EPA, 2017) and AS2436-2010: Guide to noise and vibration control on construction, demolition and maintenance sites;

- The Out of Hour Works Permit and community consultation detailed in Appendix 1 and Appendix 2 respectively has been prepared in accordance with the Project approved Noise and Vibration CEMP sub-plan (NVCS) which considers the guidelines above.

b) include consultation of all noise sensitive receivers within the Community Affected Catchments. This includes Noise Sensitive Receivers that have declined to participate in previous agreements unless a community member has explicitly requested not to be involved in any future consultation about future OOHW;

- As detailed in the project noise model (Gateway Renzo Tonin - Appendix 3) fifteen residences were identified as being impacted by the proposed works and are presented in Figure 3
 - 10 Shelley Road, Wallacia, NSW (3 db (A) above NML)
 - 9 Shelley Road, Wallacia, NSW (6 db (A) above NML)
 - 8 Shelley Road, Wallacia, NSW (4 db (A) above NML)
 - 7 Shelley Road, Wallacia, NSW (4 db (A) above NML)
 - 6 Shelley Road, Wallacia, NSW (3 db (A) above NML)
 - 5 Shelley Road, Wallacia, NSW (4 db (A) above NML)
 - 4 Shelley Road, Wallacia, NSW (3 db (A) above NML)
 - 2 Shelley Road, Wallacia, NSW (4 db (A) above NML)
 - 1 Shelley Road, Wallacia, NSW (4 db (A) above NML)
 - 2720, Silverdale Road, Wallacia, NSW (6 db (A) above NML)
- All residents have been consulted and have provided their consent for the works to take place. With the exception of 1 resident, all other residents identified in the project noise model did not raise any objections or issues with the works moving forward. Refer to Appendix 2 for further details.



Figure 3: Community Affected Catchment

c) ensure that the noise sensitive receivers understand the nature of the works and any predicted impacts, including that consideration is made of additional requirements relevant to the needs of culturally and linguistically diverse Noise Sensitive Receivers, and include details for interpreting services for languages other than English where required.

- The project team did not require support from translating and interpreting services in order to speak with residents about the proposed works. During door knocks and emails with each sensitive receiver, the proposed works were described, and the expected noise output was compared to a common household item (a refrigerator idling).

d) include in the community consultations with Noise Sensitive Receivers the following information:

i. the actual works proposed;

- The work will include digging pits and using a drilling machine to tunnel underneath the Nepean River. A temporary work site will be set-up inside Fowler Reserve to enclose the drilling machine and a second temporary work site will be set-up inside private property next to Silverdale Road (as depicted in Figure 1). When the drilling machine has finished tunnelling, the pipeline will be welded and installed. We will take about 12 weeks to complete the work. The equipment will include light vehicles, a tipper truck, generator, excavator, a welding machine, drill rig and vacuum truck.

ii. any expected impacts in clear, plain English based on noise modelling;

- This work has been noise modelled and is expected to be MODERATE TO QUIET. We would compare this to the sound of a refrigerator idling. Some activities will be LOUD for short durations. We will schedule any other out of hours work so it does not occur the day before or the day of our extended Saturday works.

iii. the expected duration of the works;

- We will continue to work our standard construction hours, including Monday to Friday 7am to 6pm and Saturday 8am to 1 pm. We are seeking approval to work 5 additional hours on each Saturday to reduce the overall duration of the work in a sensitive area.
- Therefore, Saturday work hours would be 8 am until 6 pm. The work associated with extended hours is expected to be completed within a month.

iv. any expected benefits for receivers;

- Not applicable

v. any other known concurrent OOHW that will be occurring; and

- Not Applicable

vi. any other OOHW that will be occurring on the nights preceding and following the proposed works or, if the proposed work precedes or follows a weekend period, any other OOHW that will be occurring on the weekend.

- There is no planned OOHW planned for the nights before or after the extended hours proposed.

e) request consent from the Noise Sensitive Receiver for their responses to be provided to the EPA;

- Consent has been received by the residents identified in the noise model and have been detailed in Appendix 2.

f) ensure that a record is kept when a licensee is unable to contact a noise sensitive receiver after three attempts, including leaving "sorry I missed you" cards explaining the reason for the visit and requesting a return phone call; and

- Appendix 2 includes details of records for contact attempts.

g) demonstrate, where the OOHW is predicted to go on longer than 28 calendar days, that the licensee has consulted the community in relation to re-engagement periods for the purpose of determining agreement from the community is maintained and continuing.

- Not applicable.

Condition E1.3

The licensee must report to the EPA the community consultation and agreement process that was undertaken with the Community Affected Catchments. This report to the EPA must be:

a) prepared in writing;

- This document

b) detail the steps taken to fulfil the requirements of condition E1.2;

- A noise model was completed to identify the impacts of the works to the nearest residents. The project contacted the residents and provided information and details on the works planned (refer to script in Appendix 2). Residents provided consent for the works to go ahead and the project will update the residents if there are any changes to the planned works.

c) demonstrate that the Noise Sensitive Receivers understood the nature of the works and any predicted impacts, including that consideration was made of additional requirements relevant to the needs of culturally and linguistically diverse Noise Sensitive Receivers;

- The project team did not require support from translating and interpreting services in order to speak with residents about the proposed works. During door knocks and emails with each sensitive receiver, the proposed works were described and the expected noise output was compared to a common household item (a refrigerator idling) – refer to the script in Appendix 2

d) provide the script used during the community consultation with Noise Sensitive Receivers;

- Full script included in Appendix 2.

e) report community response and consent rates (including where no contact could be made) against the total community affected catchments, and must be broken down into response and consent rates based on sub-catchments that are delineated by affectation levels;

- Included in Appendix 2.

f) include a noise validation monitoring plan as required by E1.4; and

- Detailed below in Section E1.4.

g) be submitted to the EPA at least 15 business days prior to any works that are the subject of the agreement being undertaken unless prior arrangements have been made with the EPA

- Submitted on the 06/02/2024

A copy of the report must be:

- a) *kept by the licensee for the duration of this licence including on the premises, and made available to an EPA authorised officer on request; and*
- Acknowledged, a copy of this report will be kept at the premises and for the duration of EPL 21800. A copy of this report will be made available to an EPA authorised officer on request,
- b) *be made available on the licensee's project website or another website approved in writing by the EPA for the duration of the OOHWS permitted under condition E1.1. (Personal details of Noise Sensitive Receivers must be omitted).*
- Acknowledged, a copy of this report (as approved in writing by the EPA) will be made available on John Holland's website for the duration of the OOHWS permitted under condition E1.1.

Condition E1.4

Noise Validation Monitoring

A noise validation monitoring plan must be submitted to the EPA for approval as part of the community agreement documentation prior to any OOHWS occurring.

- Noise validation monitoring will be done in accordance with the Noise and Vibration CEMP Sub-plan and the CNVIS.
- Noise validation monitoring of construction noise levels will be undertaken as follows:
 - Monitoring will be undertaken at the location which is used as part of noise prediction assessments and is consistent with the project's noise prediction tool, Gatewave;
 - Monitoring will be carried out at the commencement of the activity. This will confirm that actual noise levels are consistent with noise impact predictions and that the management measures that have been implemented are appropriate;
 - Monitoring will be recorded over 15-minute sample intervals, excluding periods of extraneous noise until a representative sample has been obtained.
 - Monitoring will involve the minimum range of noise metrics, including the following A-weighted noise levels: LA90, LAeq, LA10, LA (min) and LA(max).
 - Noise measurements will be timed to ensure operation of the noisiest plant is captured.
 - Measurements will be recorded on a project-specific noise verification record form (Appendix A of the USC Noise & Vibration CEMP sub-plan).

Condition E1.5

Validation monitoring must be undertaken for any OOHWS that are the approved under condition E1.1 and must:

a) be undertaken in accordance with the monitoring plan prepared under condition E1.4;

- Validation monitoring will be undertaken as stated in condition E1.4

b) be performed by a Competent Person;

- A member of the Upper South Creek Environment Team will be conducting the noise verification monitoring. All members of the team meet the definition of a *Competent Person* in the EPL21800 Special Dictionary (E2.1).

c) be performed on at least the first 2 occasions (day, evening, nights) where OOHWS will be undertaken and are likely to impact Noise Sensitive Receivers;

- Noise monitoring will take place during the daytime period (between 8am to 1pm) and daytime OOH period one (between 1pm to 6pm) for the first two occasions.

d) be performed on any other occasion (day, evening, night) where the nature of the works is likely to cause greater noise impacts than the first 2 occasions;

- Not applicable for the nature of the works.

e) be representative of the impacts in terms of monitoring locations, time and duration of measurements; and

- Monitoring will take place at 1 Shelley Road and 2720 Silverdale Road and at the nearest resident, 9 Shelley Road. This will be conducted in 15-minute intervals. It will be undertaken during the noisiest works predicted to take place on the day. The project will also have a SiteHive noise monitor at the entry site and will be able to capture real-time data throughout the works.
- Where verification monitoring cannot take place at the nominated locations above, verification monitoring will take place at the project boundary and calculation will be done to identify the noise levels at the resident.

f) be recorded and provided to an EPA officer upon request.

- Monitoring data will be recorded and can be provided to the EPA upon request.

Condition E1.6

If validation monitoring undertaken under Condition E1.5 shows that noise levels are higher than those predicted by any noise modelling undertaken as part of the community agreement, work practices must be modified immediately so that measured noise levels do not exceed predicted levels.

Where it has been determined that works cannot be modified to achieve the predicted noise levels:

a) the licensee must report immediately to the EPA; and

- Acknowledged, the project will report to the EPA if the noise levels are above predicted levels.

b) after considering the circumstances EPA may withdraw its permission under E1.1.

- Acknowledged, the project agrees with this condition.

Condition E1.7

Ongoing community engagement and agreement

a) For any approval of OOHW under E1.1 predicted to take longer than 28 calendar days to remain valid, the licensee must be able to demonstrate agreement from the community is maintained and continuing.

- Not applicable as the proposed work is occurring on 6 Saturdays over a 6 week period.

b) To demonstrate agreement from the community is maintained and continuing the licensee must:

i. engage the community to determine if a substantial majority of Noise Sensitive Receivers continue to consent to the OOHW pursuant to the re-engagement period determined under condition E1.2(d);

- Not applicable

ii. provide the EPA with a report within 7 calendar days of the end of each re-engagement period summarising the community response including ongoing consent rates of the Noise Sensitive Receiver; and

- Not applicable

c) Where the licensee is unable to demonstrate a substantial majority of agreement from Community Affected Catchment is maintained and continuing:

i. the licensee must report immediately to the EPA; and

- Not applicable

ii. after considering the circumstances EPA may withdraw its permission under E1.1.

- Not applicable.

Conclusion

John Holland seeks the EPA's approval to undertake work outside of standard construction from 1pm to 6pm on Saturdays in the on the 24th February 2024 and in the month of March 2024 on the 2nd, 9th, 16th, 23rd and 30th, based on the agreement from 14 out of 15 residents within the Community Affected Catchment.

Appendix 1 – OOHW Permit

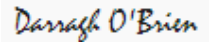
A. General Details			
Contract:	Upper South Creek (USC) Project		
Contractor:	John Holland Pty. Ltd.		
Application Title:	Nepean River HDD		
Application Number:	P0020		
Application Date:	31/01/2024		
Relevant Planning Approval:	SSI 8609189		
Environmental Protection Licence (EPL):	21800		
Contact Details			
Position	Name	Contact Number	Email
Construction Manager	Aidan O'Driscoll	0409 654 791	Aidan.o'driscoll@jhg.com.au
Senior Project Engineer	Kunaratnam Balendra	0418 979 198	Kunaratnam.balendra @jhg.com.au
Communications Representative	Sheila Maidment	0459 885 912	Sheila.maidment@jhg.com.au
Environmental Manager / Representative	Wadeea Chaudhary	0429 020 437	Wadeea.chaudhary@jhg.com.au

B. Details of Proposed Scope of Works	
Proposed Works: • Work methodologies. • List of plant / equipment to be used (worst case scenario).	HDD Operations will take place for the Nepean River underbore involving the reaming, pipe pulling, welding and any other works associated with the HDD. The works will include the following plant and equipment: • Vacuum truck x1 • Generator x2 • Excavator with bucket (25t) x1 • Drill Rig x1 • Tipper x1 The works are scheduled to occur on Saturdays (1-6PM) between 17/02/2024 and 23/03/2024.
Justification for OOHW	These works will be undertaken outside standard construction hours in accordance with condition E1.1 of the EPL 21800, which states: <i>The licensee may work outside standard construction hours (as defined in L4.1) in circumstances other than those permitted under conditions L4.3, L4.4, or any other condition of this licence if the Licensee:</i> <i>a) undertakes community consultation and agreement as described in E1.2;</i> <i>b) submits to the EPA a written request to work outside the standard construction hours attaching information set out in E1.3; and</i> <i>c) obtains approval by the EPA to work outside standard construction hours. The EPA may, in exercising its discretion to approve the works outside standard construction hours, review whether the licensee has obtained community agreement. Specifically, whether a substantial majority of the individual Noise Sensitive Receivers who together comprise the Community Affected Catchments and were contacted has consented to the planned works out of standard hours</i>
Proposed Timings	Works outside standard construction hours will be undertaken during the following Out of Hours (OOH) periods: • Day OOH (1pm – 6pm) Saturday
Worst-case number of consecutive occasions affecting the same receiver:	N/A
Acoustic Assessment attached? ☒ Yes (Refer to Appendix 1) ☐ No	

C. Assessed Noise and Vibration Impacts and Applicable Mitigation Measures		
Refer to Appendix 1 for quantitative Noise and Vibration Impact Assessment for the works.		
Mitigation Measures		
Noise / Vibration Mitigation Measure	Reasonable / Feasible (Y/N/NA)	Comments
Have you considered programming of noisy activities to reduce community impacts?	Yes	Noisy works are completed during standard hours wherever possible. The works included in this permit are subject to a community agreement where all noise impacts have been discussed with residents.
Are there alternative plant or methods that can be used to reduce noise? E.g. using smaller equipment to do the job, or using a different (quieter) method to do the job	N	HDD Works require specific plant and equipment to be used for all works and cannot be changed for the OOH period described.
Noise barriers/mats to assist noise management for all noisy works where practical	N/A	Noise barriers are not deemed an appropriate noise control for the works due to the negligible noise impacts predicted at majority of the receivers, the difference in land elevation from the site and receivers. There is also no direct line of sight for the receivers due to a number of trees.
Where possible, trucks and vehicles to be parked up between noisy works when operating near sensitive receivers.	N/A	This will be noted however, as described in the comment above, the receivers are on land that is elevated higher than the site.
All plant and equipment to minimise reversing where possible and must include the use of non-tonal reversing beepers (or an equivalent mechanism, e.g. 'quackers')	Yes	All mobile plant and equipment on site will have non-tonal reversing alarms equipped.
Staff to be briefed before works - no loud talking, excessive use of radios, music, swearing, be mindful of the community. Turn off equipment when not in use. Do not drop tools, equipment, and materials	Yes	Included in inductions and pre-starts.
Supervisors will make note of, and have removed off site and replaced any equipment item observed to have defective noise controls e.g. defective muffler, loose or missing cowling or engine compartment panels etc	Yes	Defective plant and equipment will be identified during plant inductions and during site inspections. Any defective plant/equipment will be removed and/or replaced.
During high noise impact works 3 hours on 1 hour off must be enforced unless the high noise activity is to be completed before midnight.	N/A	High noise impact work is not proposed to take place as a part of the works described in this permit.
Can temporary relocation (eg. accommodation) be offered to the adjacent sensitive receivers?	N/A	Alternative accommodation is not deemed an applicable mitigation measure as high impact activities will be completed by midnight wherever reasonable and feasible and respite from consecutive evenings/nights will also be managed as specified above.
Is minimum distance for cosmetic damage or human comfort triggered	N/A	The minimum distance for cosmetic damage or human comfort is not triggered.
Are there any additional measures that could be incorporated to further mitigate any noise impacts?	Y	- All workers are to have completed the project induction and attended the pre-start toolbox. - Pre-start toolbox is to include the requirement for workers to leave the site in a quiet and considerate manner after the completion of works, being mindful of the site's neighbours. - Workers to communicate through walkie talkies when communicating over large distances (no excessive or unnecessary shouting). - Flood lights (if required) will be directed down to prevent light spill. - Reversing alarms to be non-tonal only.

		- Plant not in use to be switched off. - Air brake silencers will be installed and operational. - No excessive or unnecessary signalling by horns. - No whistles to be used. - No excessive or unnecessary shouting. - No music radios. - No dropping of materials from height, throwing of metal items and slamming of doors. - No excessive revving of plant and vehicle engines.
Additional Mitigation Measures	Reasonable/Feasible (Y/N/NA)	Comments
Notification (N)	Y	A Gatewave Noise model (Appendix 3) has been developed which models the activity occurring in the work area. A specific notification will be issued to residents who have been predicted to exceed the NML during the daytime out of hours period.
Specific Notification (SN)	Y	A Gatewave Noise model (Appendix 3) has been developed which models the activity occurring in the work area. A specific notification will be issued to residents who have been predicted to exceed the NML during the daytime out of hours period.
Individual Briefing (IB)	N	A Gatewave Noise model (Appendix 3) has been developed which models the activity occurring in the work area. A specific notification will be issued to residents who have been predicted to exceed the NML during the daytime out of hours period. An individual briefing will be undertaken for any sensitive receiver with concerns or feedback in relation to this specific notification.
Alternative Accommodation (AA)	N	Gatewave noise model has not identified noise exceedances at any receiver who trigger AA.
Verification of predicted noise (V)	Y	Attended verification noise monitoring will be carried out at the nearest residential receiver during the start of the works (the closest available location). Works will be verified during the daytime standard hours and daytime out of hours period.
Phone Call (PC)	N/A	Gatewave noise model has not identified noise exceedances at any receiver who trigger PC
Project Specific Respite Offer (RO)	N/A	Gatewave noise model has not identified noise exceedances at any receiver who trigger RO
Duration Respite (DR)	N/A	Gatewave noise model has not identified noise exceedances at any receiver who trigger DR

D. Approval Status	
☒	OOHW Approved / Endorsed
☐	OOHW Approved with conditions (see below)
☐	OOHW Rejected
Conditions for Approval:	

Assessment of Risk Factors: ☒ Low ☐ Medium ☐ High			
Position	Name	Signature	Date
Environmental Manager (or delegate)	Darragh O'Brien		02/02/2024
Construction manager	Aidan O'Driscoll		31/1/24
Senior Project Engineer	Balendra Kunaratnam		31/01/24
Community Manager	Sheila Maidment	 !	31/01/24

Appendix 2: Community Notification

(February OOH Notification)

Appendix 2 – Community Consultation

11 January 2024

Upper South Creek Advanced Water Recycling Centre – extended working hours community agreement script

We are committed to minimising the environmental impacts of our works by choosing construction methodologies that are less impactful. This includes using horizontal directional drilling machines to install pipelines under rivers and other sensitive environments.

In Wallacia, we have used HDD to install pipeline under Jerrys Creek and will also use for installation under the Nepean River.

Nepean HDD

We will start establishing our HDD worksite inside Fowler Reserve from this month.

The work will include digging pits and using a drilling machine to tunnel underneath the Nepean River. A temporary work site will be set-up inside Fowler Reserve to enclose the drilling machine and a second temporary work site will be set-up inside private property next to Silverdale Road. When the drilling machine has finished tunnelling, the pipeline will be welded and installed. We will take about 12 weeks to complete the work.

The equipment will include light vehicles, a tipper truck, generator, excavator, a welding machine, drill rig and vacuum truck.

Map of work area:



Work hours:

We will work Monday to Friday 7am to 6pm. Our standard hours on a Saturday are 8 am until 1 pm. We are seeking your support to work 5 additional hours on each Saturday and all day Sunday to reduce the overall duration of our work in a sensitive area.

Extended Saturday work hours would be 8 am until 6 pm and Sunday work hours would be 8 am until 6 pm. The work associated with extended hours is expected to be completed within a month.

Noise levels:

This work has been noise modelled and is expected to be **MODERATE TO QUIET**. We would compare this to the sound of a refrigerator idling. Some activities will be **LOUD for short durations**.

We will schedule any other out of hours work so it does not occur the day before or the day of our extended Saturday works.

Consent:

Do you have any questions about this work or the hours we are proposing to work?

Are you ok for me to provide your name and your response to the EPA?

Consultation record

Address	Name	Attempt 1	Attempt 2	Attempt 3
9 SHELLEY ROAD, WALLACIA, NSW	Eric and Marta Jennings	11 January Did not consent to Sunday work. Would consent to extended Saturdays if program was amended. Consented to name and address and response being given to the EPA.	-	-
2 SHELLEY ROAD, WALLACIA, NSW	Gary Frazer	11 January Not home, left sorry we missed you card	16 January Not home, left sorry we missed you card	17 January Consented to extended hours and name and address to be given to the EPA.
1 SHELLEY ROAD, WALLACIA, NSW	David Walker	11 January Consented to extended hours and name and address to be given to the EPA.	-	-
3 SHELLEY ROAD, WALLACIA, NSW		11 January Not home, left sorry we missed you card.	16 January Not home, left sorry we missed you card.	17 January Spoke to real estate agent – property is vacant and for sale.
3A SHELLEY ROAD, WALLACIA, NSW		11 January Not home, left sorry we missed you card	16 January Not home, left sorry we missed you card	17 January Spoke to real estate agent – property is vacant and for sale.
8A SHELLEY ROAD, WALLACIA, NSW	Gary and Lynne Schuback	11 January Not home, left sorry we missed you card	16 January Did not consent to Sunday work. Would consent to extended Saturdays if program was amended. Consented to name and address and response being given to the EPA.	-
8B SHELLEY ROAD, WALLACIA, NSW		11 January Not home, left sorry we missed you card	16 January Not home, left sorry we missed you card	17 January Not home, left sorry we missed you card
5 SHELLEY ROAD, WALLACIA, NSW	Jane Tickner	11 January Consented to extended hours and name and address to be given to the EPA.	-	-
7 SHELLEY ROAD, WALLACIA, NSW	Sian	11 January Resident concerned about impact on fauna of construction 7 days a week – project team to provide further information	17 January EMAIL USC responded to resident's enquiries about flora and fauna impacts and further information about night work	22 January Email Follow up email sent – does not support proposal. Consented to name, address and response being provided to the EPA.
4 SHELLEY ROAD, WALLACIA, NSW		11 January Not home, left sorry we missed you card	16 January Not home, left sorry we missed you card	17 January Not home, left sorry we missed you card

6 SHELLEY ROAD, WALLACIA, NSW	Cheryl Broad	11 January Consented to extended hours and name and address to be given to the EPA.	-	-
10 SHELLEY ROAD, WALLACIA, NSW	Pam Jarvis Terence Terry Jarvis	11 January Not home, left sorry we missed you card	15 January Consented to extended hours and name and address to be given to the EPA.	-
2720 SILVERDALE ROAD, WALLACIA NSW	Cheryl Butler	17 January Email only	19 January Email	22 January Email Follow up email sent
GROVE FARM	Ross Fowler (property owner)	16 January Phone call made and voice mail left to call 1800 number. Advised property owner will contact again.	17 January Phone call x 2 to Ross voicemail left Followed by email	19 January Phone call to Ross Shared concerns about working on Sunday, it will cause hinderance to residents and Jodi as he works on the weekend Agreed for extended hours on Saturdays but not for Sunday. He consented to providing his name and response to the EPA
GROVE FARM	Jodi Chetcuit (tenant)	16 January Phone call made and voice mail left to call 1800 number. Advised tenant will contact again.	7 January Phone call to Jodi and email follow up – shared concerns about the extended hours on the weekend, it will cause hinderance and impact the way he works. Not opposed to extended hours but sharing his concerns. He consented to providing his name and response to the EPA	-

Email to stakeholders:

Sian:

From: Sian Schroder <sianschr@gmail.com>

Sent: Monday, January 22, 2024 2:52 PM

To: Upper South Creek <uppersouthcreek@sydneywater.com.au>

Subject: [External] Re: Proposed extended hours and follow up enquiry

CAUTION: This email originated from outside the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe.

Hi Rama,

Thank you for sending through this information.

Would I possibly be able to read any of the reports for the ecological surveys completed for this project in this location?

The concern of my family is still the greater impact of noise and habitat disruption, not to mention the impact towards the families living in this location to have non stop noise 7 days a week regardless of the 'minimal' increase to the baseline decibel level, along with the suggestion to completely close access to our road for 5 days.

I understand the necessity of this project, but feel that the proposed work outline should be reassessed to ensure that the residents and native animals have some relief from the disruption, alternate options could include a contra-flow with traffic lights instead of the full closure of access and no machinery use on a Sunday.

Kind regards,
Sian

From: Upper South Creek <uppersouthcreek@sydneywater.com.au>

Sent: Monday, January 22, 2024 11:05 AM

To: sianschr@gmail.com

Subject: Re: Proposed extended hours and follow up enquiry

Hi Sian,

I am just following up on my email from last week.

Did you have any feedback on our proposed extended hours? We would appreciate your feedback so we can know if the majority of the community is supportive of this proposal.

Kind regards,

Rama

Upper South Creek Project Team

Phone 1800 064 127

uppersouthcreek@sydneywater.com.au

www.sydneywatertalk.com.au/uppersouthcreek

Sydney
WATER



From: Upper South Creek <uppersouthcreek@sydneywater.com.au>

Sent: Wednesday, January 17, 2024 12:16 PM

To: sianschr@gmail.com <sianschr@gmail.com>

Subject: Proposed extended hours and follow up enquiry

Dear Sian,

Thank you for your time last week when we knocked on your door to talk about the proposed extended work hours for drilling underneath the Nepean River. You had a question around the impact to fauna from our proposed extended work hours. Please see some information below for your consideration.

Flora and Fauna

We manage flora and fauna on our sites in line with the approved Construction Environmental Management Plan for the project and a Biodiversity sub-plan has been prepared to address these concerns.

We will minimise clearing of native vegetation at the greatest extent practicable with the objective of reducing impacts to Threatened Ecological Communities, threatened species and their habitat. There are a number of measures in place to help minimise vegetation clearance and disturbance including impacts to standing dead trees and riparian zones. Where possible we will:

- limit clearing to trimming rather than the removal of whole plants
- avoid hollow-bearing trees
- where unavoidable, flag hollow-bearing trees and leave standing for as long as possible
- not undertake clearing during breeding seasons, if unavoidable, we will ensure fauna spotter / catcher is available
- under advice from ecologist, carefully reposition hollow-bearing logs into vegetation areas to be retained at the end of the project or reuse options offsite
- where vegetation clearing is required, the mitigation measures will be implemented to minimise disturbance and biodiversity impacts. Pre-clearing inspections will be undertaken by an experienced ecologist no more than 48 hours prior to the removal of vegetation to be cleared. The results of pre-clearing inspections will be recorded in a pre-clearance report and is submitted to our environmental team. The pre-clearance report will include recommended procedures and measures to manage the relocation of native fauna/flora. Where tree clearing is required, an arborist will be present on site to provide advice on how to proceed.

Additionally, we have also been consulting with Penrith City Council about vegetation removal at Fowler Reserve. As a project, we are working to enhance the vegetation through rehabilitation where possible.

Noisy works

Before we start our work, we apply standard mitigation and management measures to minimise any potential impacts. This includes measures to help reduce noise at the source and avoid unnecessary noise. We then assess the noise levels to determine the overall impact to residents and receivers. Our assessments of noise levels are conservative and always consider the worst-case scenario. The noise expected to be generated by these drilling works would be approximately 1 – 10 decibels above the background noise level (the usual daytime noise in this location) and not predicted to be much noisier than the current surrounding environment. We have taken baseline noise readings prior to our start of work and will regularly monitor noise levels during construction to ensure that we don't exceed the noise levels predicted for this work. As an additional measure, a continuous noise monitor will be set up that will run at all hours of the day and night. This will allow for the construction team to be constantly aware of the noise being generated and will assist us in ensuring we do not cause additional disturbance to our surrounding environment.

I hope this information is useful in order for you to consider our proposal to extend our Saturday work hours (8am till 6pm) and work Sundays (8am till 6pm) in order to complete the installation of the pipeline under the Nepean River sooner. We would appreciate your feedback so we can know if the majority of the community is supportive of this proposal.

Kind regards,

Upper South Creek Project Team

Phone 1800 064 127

uppersouthcreek@sydneywater.com.au

www.sydneywatertalk.com.au/uppersouthcreek

Sydney
WATER

Jodi:

From: Rama Sapkota-JHG
Sent: Wednesday, January 17, 2024 3:08 PM
To: jklchcut@gmail.com
Subject: Proposed extended hours and follow up

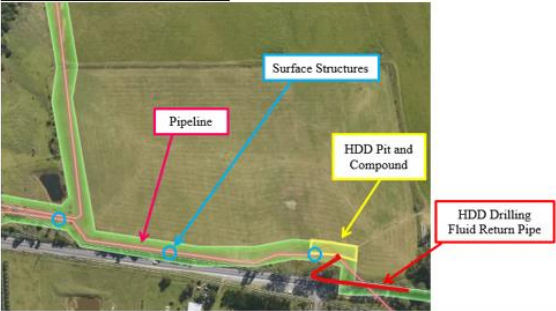
Hi Jodi,
Thank you for your time this morning over the phone to talk about the proposed extended work hours for drilling underneath the Nepean River.
As discussed, I have summarised our conversation in below email for your information and consideration.

Nepean HDD:
We are committed to minimising the environmental impacts of our works by choosing construction methodologies that are less impactful. This includes using horizontal directional drilling (HDD) machines to install pipelines under rivers and other sensitive environments.
We will start establishing our HDD worksite inside Fowler Reserve from this month. The work will include digging pits and using a drilling machine to tunnel underneath the Nepean River. A temporary work site will be set-up inside Fowler Reserve to enclose the drilling machine and a second temporary work site will be set-up inside private property next to Silverdale Road. When the drilling machine has finished tunnelling, the pipeline will be welded and installed. We will take about 12 weeks to complete the work.
The equipment will include light vehicles, a tipper truck, generator, excavator, a welding machine, drill rig and vacuum truck.
Work hours:
We will work Monday to Friday 7am to 6pm. Our standard hours on a Saturday are 8 am until 1 pm.

We are seeking your support to **work 5 additional hours on each Saturday and all-day Sunday** to complete the installation of the pipeline under the Nepean River sooner.
Extended Saturday work hours would be 8 am until 6 pm and Sunday work hours would be 8 am until 6 pm.

As discussed, the extended construction hours do impact your work as you access Grove Farm on the weekends to carry out additional work but you are not opposed to this proposition. As mentioned, as part of our consultation process, we will have to submit your contact details and your response about this proposal to the Environmental Protection Authority. Now that you have had your chance to have a think about our proposal, would you like to let me know what you think?

Map of work area:
HDD exit pit and compound location in yellow.



Ross:

Hi Ross,
My name is Rama and I work with Michael on the Upper South Creek Project. I tried calling you yesterday afternoon and this morning but was unable to get through. I have left a voicemail.
I was calling to speak to you about our proposed to extend construction hours for our upcoming work. Please see information below for your consideration and feedback. **We would appreciate your feedback so we can know if the majority of the community is supportive of this proposal.**
Additionally, the hours would also like to set up of time-lapse cameras inside Grove Farm and I have included the proposed locations below. **Can you please let me know if you are comfortable for these to be installed at below locations?**
I have also spoken to Jodi about this proposal and the time-lapse cameras.

Nepean HDD:
We are committed to minimising the environmental impacts of our works by choosing construction methodologies that are less impactful. This includes using horizontal directional drilling (HDD) machines to install pipelines under rivers and other sensitive environments.
We will start establishing our HDD worksite inside Fowler Reserve from this month. The work will include digging pits and using a drilling machine to tunnel underneath the Nepean River. A temporary work site will be set-up inside Fowler Reserve to enclose the drilling machine and a second temporary work site will be set-up inside private property next to Silverdale Road. When the drilling machine has finished tunnelling, the pipeline will be welded and installed. We will take about 12 weeks to complete the work.
The equipment will include light vehicles, a tipper truck, generator, excavator, a welding machine, drill rig and vacuum truck.
Work hours:
We will work Monday to Friday 7am to 6pm. Our standard hours on a Saturday are 8 am until 1 pm.
We are seeking your support to **work 5 additional hours on each Saturday and all-day Sunday** to complete the installation of the pipeline under the Nepean River sooner.
Extended Saturday work hours would be 8 am until 6 pm and Sunday work hours would be 8 am until 6 pm.

Map of work area:
HDD exit pit and compound location in yellow.



HDD entry pit at Fowler Reserve



Proposed time-lapse cameras:
The intent would be to install a time-lapse camera (pole-mounted) to capture the construction of the Nepean River discharge structure. This camera will take a photo either every 25 or 30 minutes of the site.
We are currently reviewing two possible locations as per image below, both near the top of the embankment. The time-lapse camera will be in place for several months, for the duration of the construction period.



Cheryl:

From: Rama Sapkota-JHG
Sent: Monday, January 22, 2024 11:00 AM
To: Cheryl Butler <cherylwvc@protonmail.com>
Subject: RE: Proposed extended hours for construction under the Nepean River

Hi Cheryl,

Hope you had a great weekend.

This is a follow up email to my previous email from last week, did you have any feedback on our proposed extended hours?

I hope below information was useful in order for you to consider our proposal to extend our Saturday work hours (8am till 6pm) and work Sundays (8am till 6pm) in order to complete the installation of the pipeline under the Nepean River sooner. We would appreciate your feedback so we can know if the majority of the community is supportive of this proposal.

Thank you,

Rama Sapkota
Senior Community Engagement Advisor - Upper South Creek project



From: Rama Sapkota-JHG
Sent: Friday, January 19, 2024 2:37 PM
To: 'Cheryl Butler' <cherylwvc@protonmail.com>
Subject: RE: Proposed extended hours for construction under the Nepean River

Hi Cheryl,

I am just following up on my email from earlier in the week.

Did you have any feedback on our proposed extended hours?

Thank you,

Rama Sapkota
Senior Community Engagement Advisor - Upper South Creek project



From: Rama Sapkota-JHG
Sent: Wednesday, January 17, 2024 4:07 PM
To: Cheryl Butler <cherylwvc@protonmail.com>
Subject: Proposed extended hours for construction under the Nepean River

Hi Cheryl,

We are reaching out to you about our proposal to extend construction hours for our upcoming work on the Upper South Creek project.

Please see information below for your consideration and feedback. **We would appreciate your feedback so we can know if the majority of the community is supportive of this proposal.**

Nepean River Horizontal Directional Drilling (HDD):
We are committed to minimising the environmental impacts of our works by choosing construction methodologies that are less impactful. This includes using HDD machines to install pipelines under rivers and other sensitive environments.

We will start establishing our HDD worksite inside Fowler Reserve from this month. The work will include digging pits and using a drilling machine to tunnel underneath the Nepean River. A temporary work site will be set-up inside Fowler Reserve to enclose the drilling machine and a second temporary work site will be set-up inside private property next to Silverdale Road. When the drilling machine has finished tunnelling, the pipeline will be welded and installed. We will take about 12 weeks to complete the work.

The equipment will include light vehicles, a tipper truck, generator, excavator, a welding machine, drill rig and vacuum truck.

Work hours:
We will work Monday to Friday 7am to 6pm. Our standard hours on a Saturday are 8 am until 1 pm.

We are seeking your support to **work 5 additional hours on each Saturday and all-day Sunday** to complete the installation of the pipeline under the Nepean River sooner.
Extended Saturday work hours would be 8 am until 6 pm and Sunday work hours would be 8 am until 6 pm.

Map of work area:
HDD entry pit at Fowler Reserve



I hope this information is useful in order for you to consider our proposal to extend our Saturday work hours (8am till 6pm) and work Sundays (8am till 6pm).

Appendix 3 – Gatewave Noise Model

Appendix 1: Noise Model



31 January 2024

2024-01-31_TM588-04 Nepean HDD OOH Day - ID TM588_065.docx

John Holland

Wadeea Chaudhary

wadeea.chaudhary@jhgc.com.au

From: Renzo Tonin and Associates via Gatewave

Calculation scenario: **Nepean HDD OOH Day** (Gatewave ID TM588_065)

Upper South Creek – Noise and Vibration Assessment Report

1 Introduction

The Renzo Tonin and Associates web-based construction assessment tool (Gatewave) has been used to prepare this noise and vibration assessment report for John Holland and the Upper South Creek Advanced Water Recycling Centre project (the Project).

The overall noise and vibration impacts from the Project works and associated mitigation measures (e.g. hoardings) have already been addressed in previous Construction Noise and Vibration Impact Statements (CNVIS) in accordance with CoA E48. This tool allows specific work areas and activities to be assessed as construction works progress. It also allows cumulative noise impact from other aspects of the Project or, where relevant noise from other construction projects, to be assessed and managed in accordance with the Construction Noise and Vibration Management Plan (USCP-JHG-MPL-ENV-0007, the 'CNVMP').

1 Assessment methodology

1.1 Construction noise

Results for the assessment of airborne noise were determined using a CadnaA computer noise model developed for the Project. The CadnaA noise model incorporates ground elevation contours, building heights, the built environment and atmospheric conditions to predict construction noise in accordance with the International Standard ISO 9613-2:1996 implementing quality standard ISO 17534-1:2015.

Results from the CadnaA noise model are exported and stored into the Gatewave database which allows for the prediction of the total cumulative noise from all construction activities.

A summary of the noise calculation parameters is detailed in Table 1.

Table 1: Summary of noise modelling parameters

Parameters	Inputs
Calculation method	ISO 9613-2:1996 implementing quality standard ISO 17534-1:2015
Location of noise sources above the local ground	1.5m
Height of receivers	1.5m above ground level to represent 1.5m above ground floor level Additional 3m height for every additional floor assessed (i.e. 4.5m above ground for first floor, 7.5m for second floor etc.)
Sound Power Levels (L_w) of plant and equipment	All L_w data obtained from Renzo Tonin & Associates database Detailed in Section 2
Construction activities	Detailed in Section 2
Ground absorption	Varying from 1 for absorptive surfaces (e.g. park land), 0.5 (e.g. residential areas) to 0 for reflective surfaces (e.g. water, concrete, paving);
Noise barriers and screening	As detailed in Project CNVIS

1.2 Construction vibration

If there are any vibration intensive plant and equipment, the recommended minimum working distances (MWD) are presented in Table 4.

2 Construction activities, work areas and NCAs

2.1 Justification to complete the works OOH

These works will be undertaken outside standard construction hours in accordance with condition E1.1 of the EPL 21800, which states:

The licensee may work outside standard construction hours (as defined in L4.1) in circumstances other than those permitted under conditions L4.3, L4.4, or any other condition of this licence if the Licensee:

- undertakes community consultation and agreement as described in E1.2;
- submits to the EPA a written request to work outside the standard construction hours attaching information set out in E1.3; and

c) obtains approval by the EPA to work outside standard construction hours. The EPA may, in exercising its discretion to approve the works outside standard construction hours, review whether the licensee has obtained community agreement. Specifically, whether a substantial majority of the individual Noise Sensitive Receivers who together comprise the Community Affected Catchments and were contacted has consented to the planned works out of standard hours

2.2 Construction activities

2.2.1 Plant and equipment use

A summary of the plant and equipment operating during each assessment time period is presented in Table 2. Note that Table 2 identifies if a plant/equipment item is used for part or all of the assessment period on a given day, and does not necessarily denote if the plant/equipment are operating concurrently (refer APPENDIX A for details on which plant/equipment are operating together).

Table 2: Proposed construction activities and associated sound power levels

Activity/plant/equipment	Number in use				Sound power level, dB(A)		High impact item	Noise reduction from mitigation measures, dB(A)
	Day	Day (OOH)	Evening	Night	Leq	Lmax		
New work area								
Drill Rig	1	1	-	-	106	116	-	-
Generator	1	1	-	-	94	95	-	-
Generator	1	1	-	-	94	95	-	-
Excavator w bucket (25t)	1	1	-	-	103	108	-	-
Vacuum truck	1	1	-	-	107	111	-	-
Tipper	1	1	-	-	103	111	-	-
New work area								
Welding tools /oxy	1	1	-	-	102	105	-	-
Drill Rig	1	1	-	-	106	116	-	-
Excavator w bucket (25t)	1	1	-	-	103	108	-	-
Vacuum truck	1	1	-	-	107	111	-	-
Generator	1	1	-	-	94	95	-	-

Notes:

- 1) Refer APPENDIX A for plant/equipment timings and to identify which items operate concurrently.
- 2) Equipment marked in **orange** are not verified by Renzo Tonin and Associates

The locations of the construction activities are presented in Figure 1.

Figure 1: Construction work areas



Locations of works

 Work area



3 Construction noise and vibration impacts

3.1 Predicted noise levels

3.1.1 Construction $L_{Aeq,15min}$ assessment

Noise levels were determined by modelling the noise sources, receiver locations, and operating activities, based on the information presented in Table 2.

The noise predictions presented in this report represent a realistic worst-case scenario when construction occurs at the closest location within a specific work area. At each receiver, noise levels will vary during the construction period based on the position of equipment within the work area, the distance to the receiver, the construction activities being undertaken and the noise levels of particular plant items and equipment. Actual noise levels will often be less than the predicted levels presented.

A summary of the results is presented in Table 3. NMLs and predictions for the three worst-affected receivers for each works area are provided in Table 5. Results are presented visually in noise maps in APPENDIX C.

Table 3: Summary of receivers above relevant NMLs

NCA	Day		Day (OOH)		Evening		Night	
	dB(A) above NML	No. of properties	dB(A) above NML	No. of properties	dB(A) above NML	No. of properties	dB(A) above NML	No. of properties
NCA T6	0 to 10	1	0 to 5	9	0 to 5		0 to 5	13
	> 10	0	6 to 15	1	6 to 15		6 to 15	0
	Over 75 dB(A)	0	16 to 25	0	16 to 25		16 to 25	0
			> 25	0	> 25		> 25	0
NCA T8	0 to 10	1	0 to 5	0	0 to 5		0 to 5	3
	> 10	0	6 to 15	1	6 to 15		6 to 15	0
	Over 75 dB(A)	0	16 to 25	0	16 to 25		16 to 25	1
			> 25	0	> 25		> 25	0
Commercial	0 to 10	0	0 to 5	0	0 to 5		0 to 5	0
	> 10	0	6 to 15	0	6 to 15		6 to 15	0
	Over 75 dB(A)	0	16 to 25	0	16 to 25		16 to 25	0
			> 25	0	> 25		> 25	0
Educational	0 to 10	0	0 to 5	0	0 to 5		0 to 5	0
	> 10	0	6 to 15	0	6 to 15		6 to 15	0
	Over 75 dB(A)	0	16 to 25	0	16 to 25		16 to 25	0
			> 25	0	> 25		> 25	0
Recreational - Active	0 to 10	0	0 to 5	0	0 to 5		0 to 5	0
	> 10	0	6 to 15	0	6 to 15		6 to 15	0
	Over 75 dB(A)	0	16 to 25	0	16 to 25		16 to 25	0
			> 25	0	> 25		> 25	0
Industrial	0 to 10	0	0 to 5	0	0 to 5		0 to 5	0
	> 10	0	6 to 15	0	6 to 15		6 to 15	0

NCA	Day		Day (OOH)		Evening		Night	
	dB(A) above NML	No. of properties	dB(A) above NML	No. of properties	dB(A) above NML	No. of properties	dB(A) above NML	No. of properties
	Over 75 dB(A)	0	16 to 25	0	16 to 25		16 to 25	0
			> 25	0	> 25		> 25	0
	0 to 10	0	0 to 5	0	0 to 5		0 to 5	0
	> 10	0	6 to 15	0	6 to 15		6 to 15	0
Community centre	Over 75 dB(A)	0	16 to 25	0	16 to 25		16 to 25	0
			> 25	0	> 25		> 25	0
	0 to 10	0	0 to 5	0	0 to 5		0 to 5	0
	> 10	0	6 to 15	0	6 to 15		6 to 15	0
Place of Worship	Over 75 dB(A)	0	16 to 25	0	16 to 25		16 to 25	0
			> 25	0	> 25		> 25	0
	0 to 10	0	0 to 5	0	0 to 5		0 to 5	0
	> 10	0	6 to 15	0	6 to 15		6 to 15	0
Hotel/Motel/Hotel	Over 75 dB(A)	0	16 to 25	0	16 to 25		16 to 25	0
			> 25	0	> 25		> 25	0
	0 to 10	0	0 to 5	0	0 to 5		0 to 5	0
	> 10	0	6 to 15	0	6 to 15		6 to 15	0
Recreational - Passive	Over 75 dB(A)	0	16 to 25	0	16 to 25		16 to 25	0
			> 25	0	> 25		> 25	0
	0 to 10	0	0 to 5	0	0 to 5		0 to 5	0
	> 10	0	6 to 15	0	6 to 15		6 to 15	0

3.2 Predicted vibration levels

The recommended MWDs for cosmetic damage and human annoyance are presented in Table 4.

Table 4: Generic minimum working distances for cosmetic damage and human annoyance

Plant item	Reference	Minimum working distance, m			
		Cosmetic damage (screening criteria)		Human comfort (screening limit)	
		Heritage buildings	Non-heritage	Residential ¹	Non-residential ²
Drill Rig	RTA DRILL_010	10	5	20	10

Notes:

1. Screening limit for residences, night time
2. Screening limit for offices, schools, educational institutions and places of worship (day or night)

3.3 Mitigation measures

3.3.1 Specific reasonable and feasible mitigation measures

As per section C of the OOHW Permit.

3.3.2 Additional noise mitigation measures

In accordance with the CNVG, where, after application of all reasonable and feasible mitigation measures, the $L_{Aeq(15\text{minute})}$ airborne construction noise levels are still predicted to exceed the NMLs, additional airborne noise mitigation measures can be applied to further limit the risk of annoyance from construction noise.

Figure 2: Additional airborne noise mitigation measures

When is the work being undertaken?	How much does the predicted noise level exceed the ANML by?	Identify additional management measures to be implemented	Additional mitigation measure code
All Hours	75 dB(A) or greater	V, N, PC, RO	AM2
Standard Hours M-F 7am to 6pm Sat 8am to 6pm	0 dB(A)	-	-
	≤ 10 dB(A)	-	-
	10 to 20 dB(A)	V, N	AM1
	> 20 dB(A)	V, N	AM1
OOHW Period 1 M-F 6pm to 10pm Sat 6pm to 10pm Sun/ PH 8am to 10pm	< 5 dB(A)	-	-
	5 to 15 dB(A)	N, R1, DR	AM3
	15 to 25 dB(A)	V, N, R1, DR	AM4
	> 25 dB(A)	V, N, SN, IB, PC, R1, DR	AM5
OOHW Period 2* M-F 10pm to 7am Sat 10pm to 8am Sun/ PH 6pm to 8am	< 5 dB(A)	N	AM6
	5 to 15 dB(A)	V, N, R2, DR	AM7
	15 to 25 dB(A)	V, N, SN, IB, PC, R2, DR	AM8
	> 25 dB(A)	AA, V, N, SN, IB, PC, R2, DR	AM9

Notes: Use the abbreviation codes in the table above to confirm management measures required

* Where OOHW occur in the evening/night shoulder period (10pm to 12am) or the night/morning shoulder period (5am to 7am) apply additional airborne mitigation measures from the OOHW Period 2, excluding AA.

N = Notification (should be issued a minimum of five working days prior to the start of works)

SN = Specific notifications (issued no later than seven calendar days ahead of construction activities)

IB = Individual briefing

PC = Phone Call

AA = Alternative accommodation**

RO = Project specific respite offer

R1 = Respite period 1

V = Verification of predicted noise

DR = Duration respite

R2 = Respite period 2

** Where construction activity impacts receiver for more than two consecutive nights, AA is not applicable to shoulder periods.

3.3.3 Noise monitoring plan

Attended noise monitoring is to be undertaken to verify that noise levels resulting from works are in accordance with the levels predicted in this noise and vibration assessment report, subject to obtaining the property owner/occupier's consent to access the property (where required). Noise monitoring should be carried out on or near the property boundary at a location representative of the worst affected location (i.e. in publicly accessible areas on or near the nominated receivers, typically at ground level).

Table 5 identifies potential monitoring locations in each NCA, which are the three worst noise-affected receivers for each NCA from the works.

Note: Gatewave tries to find the most affected receivers in each NCA (up to 3 locations) purely based on the numerical results. These locations will be reviewed for suitability based on safety, accessibility, will provide valid data, etc. If not suitable, alternative suitable locations will be selected for verification monitoring.

If monitoring levels exceed predicted levels, continual improvement and corrective action measures will be implemented, (e.g. investigate cause, review work or activity, scheduling, etc).

Table 5: Nominated verification monitoring locations

Receiver			Noise management levels (NMLs), dB(A)				Sleep disturbance goals, dB(A)		Predicted noise levels, dB(A) Leq,15min				Predicted noise levels, dB(A) Lmax
NCA	Address	Land use	NML Day	NML Day (OOH)	NML Evening	NML Night	Lmax (screening)	Lmax (limit)	Day	Day (OOH)	Evening	Night	Night
NCA T6	1 SHELLEY ROAD, WALLACIA, NSW	Residential	55	50	45	40	55	65	54	54	-	-	-
NCA T6	6 SILVERDALE ROAD, WALLACIA, NSW	Residential	55	50	45	40	55	65	48	48	-	-	-
NCA T8	2720 SILVERDALE ROAD, WALLACIA, NSW	Residential	50	45	40	35	55	65	51	51	-	-	-
NCA T8	2680 SILVERDALE ROAD, WALLACIA, NSW	Residential	50	45	40	35	55	65	38	38	-	-	-
NCA T8	2720 SILVERDALE ROAD, WALLACIA, NSW	Residential	50	45	40	35	55	65	36	36	-	-	-

3.3.4 Vibration monitoring

It is noted that the generic MWDs in Table 4 are taken from a database of vibration levels measured at various sites or obtained from other sources (e.g. BS5228-2:2009). They are not specific to these works as final vibration levels are dependent on many factors including the actual plant used, its operation and the intervening geology between the activity and the receiver.

Site specific MWDs for vibration significant plant items must be measured on site where plant and equipment are likely to operate close to or within the generic MWDs for both cosmetic damage and human annoyance. These site specific MWDs will then be included in Gatewave.

If works are likely to be within the generic or site specific MWDs, attended vibration monitoring is to be undertaken to verify that vibration levels comply with the vibration objectives described in the CNVMP.

Additional monitoring for human annoyance from vibration would be carried out proactively and in response to vibration complaints.

Vibration monitoring should follow the procedures outlined in Appendix F of the CNVG.

Important disclaimer

* This document has been partly automatically generated by Gatewave™, software for prediction, assessment and management of noise and vibration, developed by Renzo Tonin and Associates.

* This document is uncontrolled. Please contact Renzo Tonin and Associates if you suspect there are any errors in this report.

* Results in this report are based on the assumptions described in Section 0 and inputs presented in Section 2. Noise and vibration monitoring data will be collected to ensure Gatewave is verified and adjusted, if required.

* Renzo Tonin and Associates cannot be held liable for the misuse of the software Gatewave™, including any errors that may be contained within the software.

APPENDIX A Summary of works

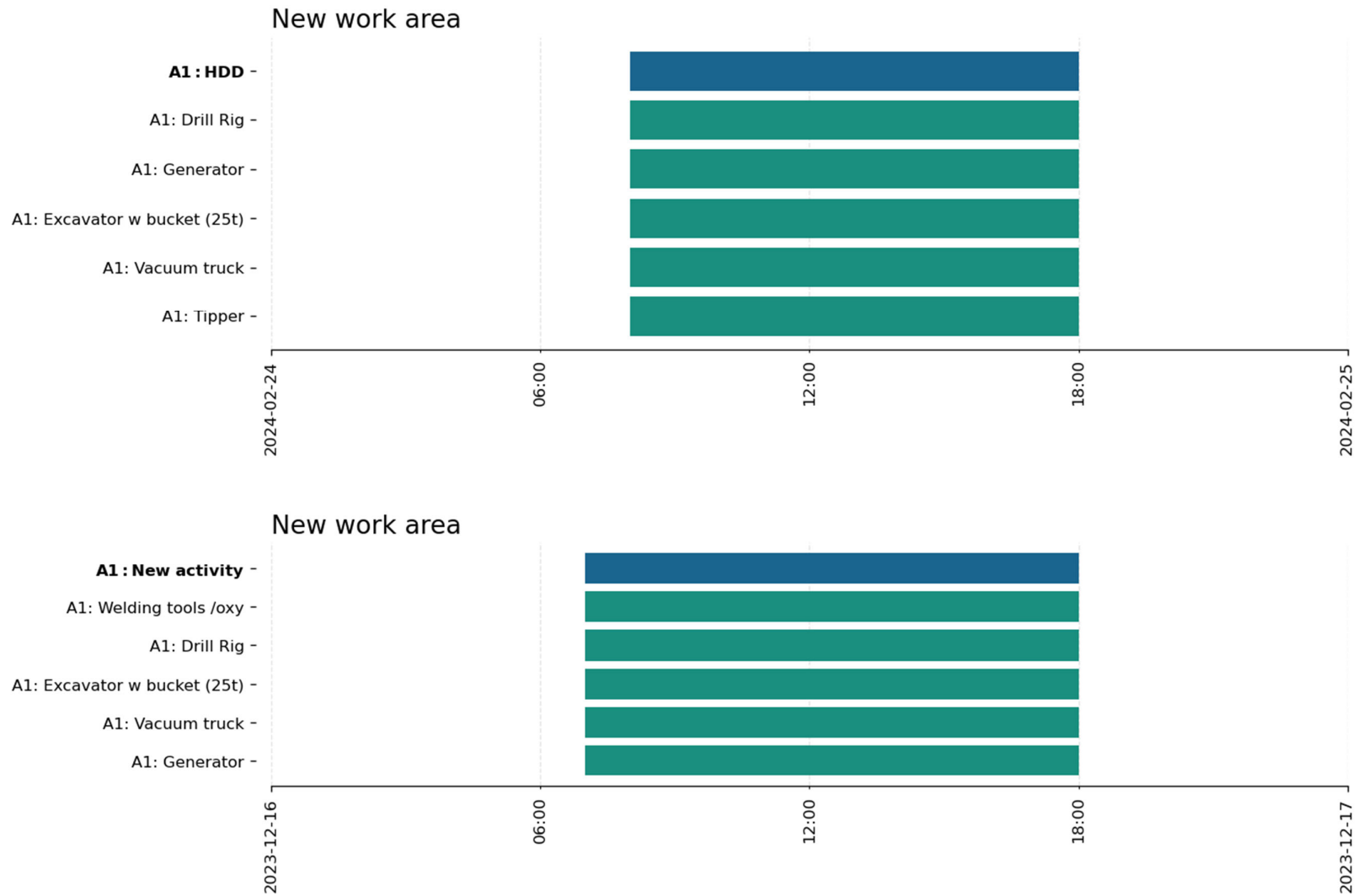
A.1 Plant and equipment

Table 6: Plant and equipment schedule for work area: New work area

Equipment	Penalty, dB(A)	Quantity	Intensity	Reduction, dB	Sound power level, dB(A)		Start time	End time
					L _{eq,15min}	L _{max}		
HDD								
Drill Rig	-	1	100%	0	106	116	2024-02-17 08:00:00	2024-02-17 18:00:00
Generator	-	1	100%	0	94	95	2024-02-17 08:00:00	2024-02-17 18:00:00
Generator	-	1	100%	0	94	95	2024-02-17 08:00:00	2024-02-17 18:00:00
Excavator w bucket (25t)	-	1	100%	0	103	108	2024-02-17 08:00:00	2024-02-17 18:00:00
Vacuum truck	-	1	100%	0	107	111	2024-02-17 08:00:00	2024-02-17 18:00:00
Tipper	-	1	100%	0	103	111	2024-02-17 08:00:00	2024-02-17 18:00:00

Table 7: Plant and equipment schedule for work area: New work area

Equipment	Penalty, dB(A)	Quantity	Intensity	Reduction, dB	Sound power level, dB(A)		Start time	End time
					L _{eq,15min}	L _{max}		
New activity								
Welding tools /oxy	-	1	100%	0	102	105	2024-02-17 08:00:00	2024-02-17 18:00:00
Drill Rig	-	1	100%	0	106	116	2024-02-17 08:00:00	2024-02-17 18:00:00
Excavator w bucket (25t)	-	1	100%	0	103	108	2024-02-17 08:00:00	2024-02-17 18:00:00
Vacuum truck	-	1	100%	0	107	111	2024-02-17 08:00:00	2024-02-17 18:00:00
Generator	-	1	100%	0	94	95	2024-02-17 08:00:00	2024-02-17 18:00:00



APPENDIX B Noise level above nominated target



